

Package ‘venny’

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Title Venn Diagram

Version 0.0.2

Description Generate Venn plots, summary tables, and ellipse paths for polygon clipping.
Provides direct access to subsets of interest and offers flexible customization of Venn diagrams.
Summary tables are also available when Venn diagram visualization is not suitable.

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Encoding UTF-8

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Imports ggplot2, polyclip

Depends R (>= 4.1)

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bits_encoding	<i>Create a bits matrix</i>
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Description

Produce a bits matrix for all possible combinations of the input sets.

Usage

```
bits_encoding(x, rownames = TRUE, sep = "")
```

Arguments

x	A character vector.
rownames	Logical (default: TRUE). Whether to show rownames.
sep	A character used to separate the group names (default is ""). Only working when rownames = TRUE.

Value

A numeric matrix with values of 0 or 1.

Examples

```
bits_encoding(c("A", "B", "C", "D"))
```

ellipse_line	<i>Control the ellipse textures</i>
--------------	-------------------------------------

Description

This is used to generate the ellipse line color and transparency parameters, for passing into the venny()s ellipse.line argument.

Usage

```
ellipse_line(  
  linetype = "blank",  
  linewidth = 0.5,  
  color = c("#CC79A7", "#009E73", "#E69F00", "#56B4E9"),  
  alpha = 0.5  
)  
  
ellipse_fill(  
  color = c("#CC79A7", "#009E73", "#E69F00", "#56B4E9"),  
  alpha = 0.2  
)
```

Arguments

linetype	A character. The options are: blank, solid, dashed, dotted, dotdash, longdash, twodash.
linewidth	A number (default: 0.5).
color	A character vector (default: c("#009E73", "#E69F00", "#CC79A7", "#56B4E9")).
alpha	A number range from 0 to 1 (default: 0.5). Set the line transparency.

Value

A list contains "color" and "alpha" values.

See Also

[ellipse_fill\(\)](#)

Examples

```
ellipse_line()
```

ellipse_position	<i>Ellipse positions</i>
------------------	--------------------------

Description

This is an internal function used to generate the ellipse parameters that was used by the `generate_ellipse_path()` function. It returns a list encompassing 3 lists. Each list consists of the x0, y0, long-arm, short-arm, and angle default values for generating 2, 3, or 4 ellipses.

Usage

```
ellipse_position()
```

Value

A two-layer nested list.

Examples

```
ellipse_position()
```

fixed_length

Fixed Length Vector

Description

Create a desired length of vector by trimming/extending the x vector.

Usage

```
fixed_length(x, len, fill_with = NULL)
```

Arguments

x	A vector.
len	Desired length.
fill_with	Element used to extend the vector length. If set to NULL, extend by itself (default: NULL).

Value

A vector

Examples

```
# Extend `x` to fulfill the `len` requirement
fixed_length(1:5, 7)
# Trim `x` to fulfill the `len` requirement
fixed_length(1:5, 3)
```

generate_ellipse_path *Generate Ellipse Path*

Description

Generate Ellipse Path

Usage

```
generate_ellipse_path(x0 = 0, y0 = 0, a = 2, b = 1, angle = 0, density = 200)
```

Arguments

x0	The coordinate x of the polygon center point (default: 0).
y0	The coordinate y of the polygon center point (default: 0).
a	Long arm (default: 2).
b	Short arm (default: 1).
angle	Rotation angle in degree (default: 0).
density	Greater amount of points yield smoother ellipse (default: 200).

Value

A data.frame with the point coordinates (x, y) to construct the polygon

Examples

```
library(ggplot2)
# Draw a circle
circle <- generate_ellipse_path(a = 1, b = 1)
ggplot(circle, aes(x, y)) +
  geom_polygon() +
  coord_fixed()
# Draw an ellipse
ellipse <- generate_ellipse_path(a = 2, b = 1, angle = 45)
ggplot(ellipse, aes(x, y)) +
  geom_polygon() +
  coord_fixed()
```

 highlight

Draw polygons to highlight subsets

Description

A handy wrapper for the `ggplot2::geom_polygon()` used to represent the result of set operations.

Usage

```
highlight(
  venn,
  setops,
  color = "transparent",
  linewidth = 1.5,
  linetype = "solid",
  fill = "black",
  alpha = 0.4,
  ...
)
```

Arguments

<code>venn</code>	Venn diagram produced from <code>venny::venny()</code> .
<code>setops</code>	The result of set operations.
<code>color</code>	Character (default: "transparent"). The polygon line color.
<code>linewidth</code>	Numeric (default: 1.5). The polygon linewidth.
<code>linetype</code>	Character (default: "solid"). The polygon linetype.
<code>fill</code>	Character (default: "black"). The polygon color.
<code>alpha</code>	Numeric (default: 0.4). The polygon transparency (0-1).
<code>...</code>	The other arguments passed into <code>ggplot2::geom_polygon</code> .

Value

A `ggplot` object.

Examples

```
data <- list(
  Set_A = c(10:100, 500:600),
  Set_B = c(5:150, 550:650),
  Set_C = c(80:180, 580:680),
  Set_D = c(120:220, 520:620)
)
out <- venny(data, detail = TRUE)
p0 <- out$venn
ep <- out$ellipse_path
```

```
res <- intersect(ep$Set_A, ep$Set_B, ep$Set_D)
highlight(p0, res)
```

how_many_subsets	<i>How many subsets</i>
------------------	-------------------------

Description

Calculate the number of combinations that can be derived from the given character vector.

Usage

```
how_many_subsets(x, detail = FALSE)
```

Arguments

x A character vector.
detail Logical (default: FALSE). Whether to output the combinations.

Value

An integer value or a list.

Examples

```
how_many_subsets(c("qqa", "bnk", "sdf", "123"))
```

LGL23	<i>RNA-seq data</i>
-------	---------------------

Description

A list of essential information for RNA-seq analysis and an example for demonstration.

Usage

```
LGL23
```

Format

An object of class `list` of length 4.

Details

- `sample_info`: the information for the sample IDs noted in the count matrix.
- `GFD`: A `data.frame` of gene functional description.
- `count_matrix`: A matrix of the gene expression count reads for each sample. The row names are gene IDs; the column names are sample IDs.
- `DEGs`: An example demonstrating differentially expressed genes across four conditions.

 setops

Set operations

Description

Perform intersection (`intersect()`), union (`union()`), and difference (`setdiff()`) for multiple `venny_ep` objects representing sets. They are handy wrappers of the `polyclip::polyclip()` function.

Usage

```
intersect(x, y, ...)

union(x, y, ...)

setdiff(x, y, ...)

## S3 method for class 'venny_setops'
intersect(x, y, ...)

## S3 method for class 'venny_setops'
union(x, y, ...)

## S3 method for class 'venny_setops'
setdiff(x, y, ...)
```

Arguments

<code>x</code>	A two-column matrix consists of the point coordinates (x, y) used to construct the ellipse. This is the reference-ellipse used to be clipped by the others.
<code>y</code>	A two-column matrix consists of the point coordinates (x, y) used to construct the ellipse. This is the object-ellipse used to clip the reference ellipse, i.e. <code>x</code> .
<code>...</code>	The other object-ellipses.

Details

These functions override the base versions to make them generic so that `venny` can provide methods to proceed the `venny_ep` class object. The default methods call the base versions.

Value

A list contains one or multiple two-column dataframe. Each dataframe is the point coordinates (x, y) used to construct a polygon.

Examples

```
data <- list(
  Set_A = c(10:100, 500:600),
  Set_B = c(5:150, 550:650),
  Set_C = c(80:180, 580:680),
  Set_D = c(120:220, 520:620)
)
out <- venny(data, detail = TRUE)
p0 <- out$venn
ep <- out$ellipse_path

#----- Intersection -----#
res <- intersect(ep$Set_A, ep$Set_B, ep$Set_D)
highlight(p0, res)

#----- Union -----#
res <- union(ep$Set_A, ep$Set_C, ep$Set_D)
highlight(p0, res)

#----- Difference -----#
res <- setdiff(ep$Set_B, ep$Set_D, ep$Set_A, ep$Set_C)
highlight(p0, res)

#----- Multiple operations -----#
res <- union(ep$Set_A, ep$Set_B, ep$Set_C) |>
  intersect(ep$Set_D) |>
  setdiff(ep$Set_B)
highlight(p0, res)
```

set_label_default	<i>Set labels</i>
-------------------	-------------------

Description

This is an internal function for venny() to automatically generate set labels, when the input list is unnamed.

Usage

```
set_label_default(n_sets)
```

Arguments

n_sets An integer.

Value

A list.

Examples

```
set_label_default(3)
```

set_label_font	<i>Set label font</i>
----------------	-----------------------

Description

Generate a list of the available set label font parameters.

Usage

```
set_label_font(  
  family = "sans",  
  face = "bold",  
  size = 5,  
  color = c("#CC79A7", "#009E73", "#E69F00", "#56B4E9"),  
  angle = NULL  
)
```

```
subset_label_font(  
  family = "sans",  
  face = "bold.italic",  
  size = 4,  
  color = "black",  
  angle = 0  
)
```

```
subset_count_font(  
  family = "sans",  
  face = "plain",  
  size = 4,  
  color = "grey20",  
  angle = 0  
)
```

```
subset_percentage_font(  
  family = "sans",  
  face = "plain",  
  size = 4,  
  color = "grey20",  
  angle = 0  
)
```

Arguments

family	Character (default: "sans").
face	Character (default: "bold").
size	Numeric (default: 5).
color	Character (default: c("#009E73", "#E69F00", "#CC79A7", "#56B4E9")).
angle	Numeric NULL (default: NULL).

Value

A list.

Examples

```
set_label_font()
```

```
set_label_position      Set label position
```

Description

Generate the coordinates for the set labels. This is passed into the `venny()`'s `set.label.position` arguments.

Usage

```
set_label_position(hjust = 0, vjust = 0, show = NULL, hide = NULL)
```

```
subset_label_position(hjust = 0, vjust = 0, show = NULL, hide = NULL)
```

```
subset_count_position(hjust = 0, vjust = 0, show = NULL, hide = NULL)
```

Arguments

hjust	A numeric vector (default: 0). Horizontal adjustment, adjust the x-axis coordinates of the set labels.
vjust	A numeric vector (default: 0). Vertical adjustment, adjust the y-axis coordinates of the set labels.
show	A character vector (default: NULL). Show only the specified set labels. By default, show all labels.
hide	A character vector (default: NULL). Do not show the specified set labels. By default, show all labels.

Value

A list contains 3 named list. Each named list contains the x, y coordinates of the set labels for different venn diagram (2, 3, or 4 ellipses), respectively.

Examples

```
set_label_position()
```

 venny

Venn diagram

Description

Venn diagram

Usage

```
venny(
  data,
  detail = FALSE,
  ellipse.line = ellipse_line(),
  ellipse.fill = ellipse_fill(),
  ellipse.density = 200L,
  set.label = TRUE,
  set.label.position = set_label_position(),
  set.label.font = set_label_font(),
  subset.label = TRUE,
  subset.label.position = subset_label_position(),
  subset.label.font = subset_label_font(),
  subset.count = TRUE,
  subset.count.position = subset_count_position(),
  subset.count.font = subset_count_font(),
  subset.percentage = TRUE,
  subset.percentage.position = subset_count_position(vjust = -0.3),
  subset.percentage.font = subset_percentage_font(),
  subset.percentage.rounding = 1L
)
```

Arguments

<code>data</code>	A list with 2 to 4 vectors
<code>detail</code>	Logical (default: TRUE). If TRUE, output a list contains the venn diagram and summary table. Otherwise, output only venn diagram.
<code>ellipse.line</code>	A list. See <code>ellipse_line()</code> .
<code>ellipse.fill</code>	A list. See <code>ellipse_fill()</code> .
<code>ellipse.density</code>	An integer (default: 200L). Higher value yield smoother ellipse.
<code>set.label</code>	Logical (default: TRUE). If TRUE, show the set labels.
<code>set.label.position</code>	A list. See <code>set_label_position()</code> .

`set.label.font` A list. See `set_label_font()`.
`subset.label` Logical (default: TRUE). If TRUE, show the subset labels. If a named list is provided, then the selected subset name will be renamed. For example, `list(AB = "new_AB")` will change the original subset AB name to "new_AB".
`subset.label.position`
A list. See `subset_label_position()`.
`subset.label.font`
A list. See `subset_label_font()`.
`subset.count` Logical (default: TRUE). If TRUE, show the element counts for each subset.
`subset.count.position`
A list. See `subset_count_position()`.
`subset.count.font`
A list. See `subset_count_font()`.
`subset.percentage`
Logical (default: TRUE). If TRUE, show the percentages of the counts.
`subset.percentage.position`
A list. See `subset_percentage_position()`.
`subset.percentage.font`
A list. See `subset_percentage_font()`.
`subset.percentage.rounding`
An integer (default: 1L). How many decimal points.

Value

A venn diagram which is a ggplot object.

Examples

```
lst <- LGL23$DEGs
venny(lst)
```

`venn_summary`

Create a venny summary data.frame

Description

A data.frame consists of each combination of the input sets.

Usage

```
venn_summary(data = list(), show_elements = FALSE)
```

Arguments

`data` A named list contains 2 ~ 26 sets of elements. For example, `list(set1 = 1:5, set2 = 3:7)`.
`show_elements` Logical (default: FALSE). List out the elements of each zone in the dataframe.

Value

A data frame contains necessary information for subsequent inferences and plotting.

Examples

```
venn_summary(LGL23$DEGs)
```

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